

axons and degenerating terminals were found. (4) The number of axonal varicosities around PNs was significantly smaller (control: $67.9 \pm 0.36/\text{PN}$ vs. STZ: $52.19 \pm 0.09/\text{PN}$; $P < 0.01$).

Conclusion: Thus, diabetes significantly altered the structure of cardiac ganglia and reduced vagal efferent projections to cardiac ganglia. This may provide an anatomical substrate for diabetes-induced impairment of baroreflex sensitivity in STZ mice.

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Keywords: Baroreflex, vagal efferent, cardiac ganglia, diabetes

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P.212 Parasympathetic involvement in sleep medicine, cardiovascular implications

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Background: Resting parasympathetic excess (PE) is associated with day-time sleepiness. PE from a sympathetic challenge is associated with sleep disturbances, including difficulty falling asleep and frequent waking. PE is also associated with bradycardia, low BP, depression and depression/anxiety syndromes. Depression is a known morbidity and mortality risk factor in CVD. Therefore, the PE associated with sleep disturbances are also contributors to associated cardiovascular risks. Correcting PE may reduce morbidity and mortality risks associated with CVD.

Methods: Serial autonomic assessment (ANSAR Medical Technologies, Inc., Philadelphia, PA) was performed on 223 patients (114 female; ave. age = 53.2 yrs) from 3 ambulatory clinics, 91 (41%, 58 female) where found with PE with reported sleep disturbances. Patients with sleep apnea were omitted. Patients with CVD and geriatrics (patients demonstrating autonomic neuropathy) where prescribed 3.125 to 6.25 mg Carvedilol. The beta-blocker component of Carvedilol treats the CVD and the alpha component, in the presence of autonomic neuropathy, indirectly treats PE. Patients contraindicated for Carvedilol were omitted from the study. Younger patients and patients without CVD were prescribed low-dose Amitriptyline (12.5 mg QD, dinner).

Discussion: This discussion focuses on the 91 patients with PE. Day-time sleep disorders (including narcolepsy, non-restorative sleep, and chronic fatigue) were diagnosed in 47 (52%). Hypothyroidism was diagnosed in 28 patients (30%). Depression was diagnosed in 56 patients (62%). Arrhythmia was diagnosed in 12 patients (13%, 9 with

atrial fibrillation). Many of the patients with depression (61%) were also diagnosed with hypertension. Therapy relieved PE (69% patients over an average of 4 months), relieved sleep disturbances (39% patients within an average of 1 week), relieved depression (72% patients within an average of 6 weeks), and reduced arrhythmia (71%).

Conclusion: PE is associated with sleep disturbances and depression which is known to elevated morbidity and mortality risk in CVD patients.

Keywords: Parasympathetic Nervous System, Sleep Medicine, Cardiovascular Medicine, Outcomes, Risk

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Effects of Exercise Training & Other Behavioral Modifications

P.213 Autonomic changes after resistance exercise in individuals with untreated stage 1 hypertension

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Aim: Subjects with hypertension have impaired autonomic modulation, whereas aerobic exercise training improves this profile. However, there is no clear evidence of autonomic modulation in response to resistance exercise. Our aim was to evaluate the autonomic response after one bout of resistance exercise in patients with untreated stage 1 hypertension.

Methods: Six men with stage 1 hypertension (age 42 ± 8 yrs; systolic blood pressure between 140 and 159 mmHg and/or diastolic blood pressure between 90 and 99 mmHg) underwent a randomized and crossover study. All of the subjects fulfilled the following criteria: age between 20 and 60 years, body mass index lower than 35 kg/m^2 , not using medications, absence of any diagnosed chronic disease, and sedentary. Subjects underwent medical examination and laboratory tests, one repetition maximum test. Autonomic modulation was assessed by analysis of signals from a digital infrared photoplethysmograph (Finometer®) yielding both time and frequency domain indices of heart rate variability and arterial baroreflex sensitivity by the alpha index. The experimental protocol included two days: one with (intervention day) the other and without (control day) one 45-min session of resistance exercise of 6 body movements composed of 3 series of 12 repetitions at 40% 1RM. Ambulatory blood pressure monitoring was applied on both days. The protocol was approved by the Ethics Committee (CCM/HUAP 180/08).

Results: Systolic blood pressure was lower after exercise (baseline: 145 ± 6 ; 0 h: 130 ± 3 mmHg, $p < 0.05$) while mean R-R intervals was shorter immediately (0 h) and 1 h after exercise, returning to baseline after 24 h on intervention day (baseline: 950 ± 25 ; 0 h: 724 ± 26 ; 1 h: 840 ± 25 ; 24 h: 907 ± 21 ms, $p < 0.01$). After exercise, the following variables were reduced when compared to baseline: standard deviation of R-R intervals (baseline: 62 ± 7 ; 0 h: 28 ± 5 ms, $p < 0.01$), mean square root of successive differences (baseline: 41 ± 6 ; 0 h: 12 ± 3 ms, $p < 0.01$), total power (baseline: 3402 ± 727 ; 0 h: $539 \pm 236 \text{ ms}^2$, $p < 0.01$), and baroreflex function (baseline: 10 ± 1 ; 0 h: $4 \pm 1 \text{ ms/mmHg}$, $p < 0.05$). There were no changes in the control day ($P > 0.05$).

Conclusion: These findings suggest that individuals with stage 1 hypertension have lower parasympathetic modulation and baroreflex